

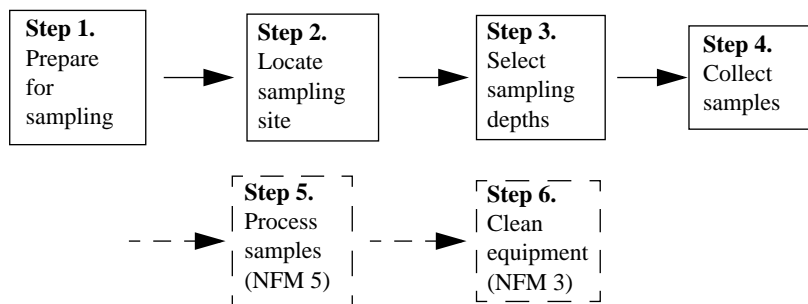
4.1.2 STILL-WATER SITES

In still water, samples generally are collected at multiple sites and at multiple depths. The probability is very small that any still-water body (lake, reservoir, pond, lock, storage pool) is relatively homogeneous with regard to any water-quality characteristic. Therefore, a single site or sampling point generally is not adequate to describe the physical and chemical properties of the water body, or the distribution and abundance of the inhabiting biological community. The number of sampling sites and the depths where samples will be collected depend on study objectives and the physical, chemical, and biological characteristics of the water body (Ward and Harr, 1990).

Thief-type samplers usually are used to collect still-water samples; however, pumping samplers also can be used. A disadvantage of pumping a sample is that if a thin stratum of water is being sampled, water can move radially from unknown depths and distances into the pump.

- ▶ Samples must be collected at a known depth.
- ▶ Sample integrity must be maintained to the degree possible while samples are being brought to the surface for further processing.

Guidelines for sampling at still-water sites



Be sure that the field effort is adequately staffed and equipped. Check QC requirements before departing—QC samples require additional equipment and supplies.

Step 1. Prepare for sampling of inorganic and organic analytes.¹⁰

- a. Upon arrival at the field site, set out safety equipment such as traffic cones and signs. Park vehicle so as to prevent sample contamination from emissions.
- b. Assemble equipment and set up a clean work space.
 - **Organic compounds.** Select equipment with fluorocarbon polymer, glass, or metal components if components will directly contact samples to be analyzed for organic compounds. **Do not use plastics other than fluorocarbon polymers.**
 - **Inorganic constituents.** Select equipment with components made of fluorocarbon polymer or other relatively inert and uncolored plastics or glass if components will directly contact samples to be analyzed for inorganic constituents. **Do not use metal or rubber components for trace-element sampling.**
 - **Microbiological analyses.** Collect microbiological samples using equipment and techniques described in NFM 7.

Step 2. Locate sampling site.

- a. Locate the first sampling site (vertical section) and maintain a sampling platform position at the site.
- b. Record depth to bottom.

Step 3. Select sampling depths.

- a. Make field measurements (such as specific electrical conductance, pH, temperature, and dissolved oxygen) in situ to obtain a vertical profile of field-measurement variation.
- b. Measure light penetration (if applicable).
- c. Select and record sampling depth(s) based on study objectives and the variation in field measurements for the vertical.

¹⁰Preparations for water sampling are described in NFM 1, 2, and 3. Consult NFM 5 for sample processing, NFM 6 for field measurements, NFM 7 for biological indicators, NFM 8 for bottom-material sampling, and NFM 9 for field safety.

Step 4. Collect samples.

Field rinse sampling equipment first (section 4.0.2). Collect samples by using the procedures listed below under Step 4A for a thief-type sampler and under Step 4B for a pump sampler.

Step 4A. Thief-type sampler.

The instructions listed below are for samplers that operate with an open/close mechanism. If the sampler operates as a point-source bailer, follow a and c–g below. Pulling the bailer up will trigger the upper check valve to seal off the sample from the water overlying the targeted depth.

- a. Lower opened sampler to the desired depth while minimizing disturbance of the water column.
- b. Isolate the sample by activating the mechanism that closes the sampler.
- c. Raise the sampler from the water body.
- d. Dispense sample to sample bottle or compositing/splitting device using *CH/DH* techniques, as required or recommended:
 - If using a bailer, drain sample through the bottom-emptying device.
 - If sample compositing and (or) splitting is required, ensure that all particulates in the sampler are transferred with the sample by swirling the sample gently to keep particulates suspended and pouring the sample quickly into the churn or cone splitter.
- e. Repeat the instructions in Step 4A a –d if more sample is needed from the same depth for that vertical section.
- f. Repeat the instructions in Step 4A a –e for each depth to be sampled in that vertical section. If a second sample from a different depth or vertical section will be composited, either (1) clean and field rinse the splitter after processing the first sample and before collecting the second sample, or (2) use another clean splitter.
- g. Move to the next site if another vertical section will be sampled. Repeat Step 4A a –f.

Step 4B. Pump sampler.

- a. Lower the pump or pump-sample tubing (attached to a weighted line) to the desired sampling depth.
- b. Turn on the pump and pump about three sample-tubing volumes to field-rinse the pump, tubing, and other sample-collection or -processing equipment. Discard rinse water.
- c. Direct sample flow into collection container(s) until sufficient sample volume has been collected.
- d. Repeat Step 4B a – c if another depth and (or) vertical section is to be sampled. If a second sample from a different depth or vertical section will be composited, either (1) clean and field rinse the splitter after processing the first sample and before collecting the second sample, or (2) use another clean splitter.

Step 5. Process samples → Refer to NFM 5.**Step 6. Clean equipment → Refer to NFM 3.**

- If the sampler will not be reused during a field trip, rinse the sampler components with deionized water before they dry and place them in a plastic bag for transporting back to the office laboratory to be cleaned (NFM 5).
- If the sampler will be reused during the field trip, rinse the components with DIW while still wet from sampling and then field-clean while at the sampling site using the prescribed procedures (NFM 3). Reassemble the sampler.
- Collect a field blank, if required, after sampling equipment has been cleaned at the sampling site.
- Place the cleaned sampler into a plastic bag and seal for transport to the next site.